Agriculture Teacher Preparation in California: Standards of Quality and Effectiveness for Subject Matter Programs

Handbook for Teacher Educators and Program Reviewers

California Commission on Teacher Credentialing

State of California

1999

Agriculture Teacher Preparation in California: Standards of Quality and Effectiveness for Subject Matter Programs

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The mission of the
California Commission on Teacher Credentialing
is to maintain and enhance quality
while encouraging innovation and creativity
in the preparation and assessment . . .
of professional educators
for California's schools.

The California Commission on Teacher Credentialing

State of California

Gray Davis, Governor

1999

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California Commission on Teacher Credentialing
1996

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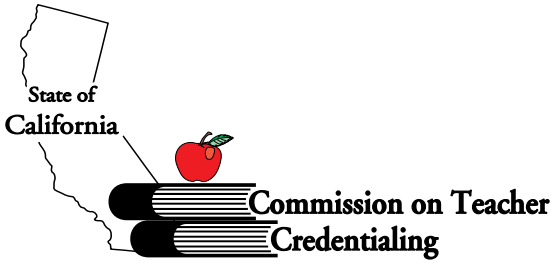

Standards and Credentials for Teachers of Agriculture: Foreword by the California Commission on Teacher Credentialing

One of the purposes of education is to enable students to learn the important subjects of the school curriculum, including agriculture. Each year in California, thousands of students enroll in agriculture classes with teachers who are certified by the California Commission on Teacher Credentialing to teach those classes in public schools. The extent to which these students attain agricultural knowledge and skills depends substantially on the quality of the preparation of their teachers in agriculture and on the teaching of agriculture.

The Commission is the agency of California government that certifies the competence of teachers and other professionals who serve in the public schools. As a policymaking body that establishes and maintains standards for the education profession in the state, the Commission is concerned about the quality and effectiveness of the preparation of teachers and other school practitioners. On behalf of students, the education profession, and the general public, the Commission's most important responsibility is to establish and implement strong, effective standards of quality for the preparation and assessment of future teachers.

In 1988 and 1992, the legislature and the governor enacted laws that strengthened the professional character of the Commission and enhanced its authority to establish rigorous standards for the preparation and assessment of prospective teachers. As a result of these reform laws (Senate Bills 148 and 1422, Bergeson), a majority of the Commission members are professional educators, and the agency is responsible for establishing acceptable levels of quality in teacher preparation and acceptable levels of competence in beginning teachers. To implement the reform statutes, the Commission is developing new standards and other policies collaboratively with representatives of postsecondary institutions and statewide leaders of the education profession.

To ensure that future teachers of agriculture have the finest possible education, the Commission decided to establish a panel of experts to review recent developments in agriculture education and to recommend new standards for the academic preparation of agriculture teachers in California. The Commission's executive director invited colleges, universities, professional organizations, school districts, county offices of education, and other state agencies to nominate distinguished professionals to serve on this panel. After receiving nominations, the executive director appointed the Agriculture Teacher Preparation and Assessment Advisory Panel (see page ii). These nine professionals were selected for their expertise in agriculture education, their effectiveness as teachers and professors of agriculture, and their leadership in the agriculture education field. The panel was also selected to represent the diversity of California educators and includes agriculture teachers as well as university professors. The panel met on several occasions during 1995 to discuss, draft, and develop the standards in this handbook. The Commission is grateful to the panelists for their conscientious work in addressing many complex issues related to excellence in the subject matter preparation of agriculture teachers.

The Agriculture Teaching Credential

The Single Subject Teaching Credential in Agriculture authorizes an individual to teach agriculture classes in departmentalized settings. The holders of this credential may teach at any grade level and may serve as agriculture specialists in elementary schools, but the majority of departmentalized agriculture classes occur in grades 7 through 12.

An applicant for a Single Subject Teaching Credential must demonstrate subject matter competence in one of two ways. The applicant may earn a passing score on a subject matter examination that has been adopted by the Commission. Alternatively, the prospective teacher may complete a subject matter preparation program that has been approved by the Commission (Education Code Sections 44280 and 44310). Regionally accredited colleges and universities that wish to offer subject matter programs for prospective teachers must submit those programs to the Commission for approval.

In California, subject matter preparation programs for prospective teachers are not the same as undergraduate degree programs. Postsecondary institutions govern academic programs that lead to the award of degrees, including baccalaureate degrees in agriculture. The Commission sets standards for academic programs that lead to the issuance of credentials, including the Single Subject Teaching Credential in Agriculture. An applicant for a teaching credential must have earned a bachelor's degree from an accredited institution, but the degree may be in a subject other than the one to appear on the credential. Similarly, degree programs for undergraduate students in agriculture may or may not fulfill the Commission's standards for subject matter preparation. Completing a subject matter program that satisfies the standards enables a candidate to qualify for the Single Subject Credential in Agriculture.

The Commission asked the Agriculture Teacher Preparation and Assessment Advisory Panel to create new standards of program quality and effectiveness that could be used to review and approve subject matter preparation programs. The Commission requested the development of standards to emphasize the knowledge, skills and perspectives that teachers must have learned in order to be effective in teaching the subjects that are most commonly included in agriculture courses in the public schools of California.

Standards of Program Quality and Effectiveness

In recent years, the Commission has thoroughly redesigned its policies regarding the preparation of education professionals and the review of preparation programs in colleges and universities. In initiating these reforms, the Commission embraced the following principles or premises regarding the governance of educator preparation programs. The Commission asked the Agriculture Teacher Preparation and Assessment Advisory Panel to apply these general principles to the task of creating standards for subject matter programs in agriculture.

(1) *The status of teacher preparation programs in colleges and universities should be determined on the basis of standards that relate to significant aspects of the quality of those programs.* Program quality may depend on the presence or absence of specified features of programs, so some standards require the presence or absence of these features. It is more common, however, for the quality of educational programs to depend on *how well* the program's features have been designed and implemented in practice. For this reason, most of the Commission's program standards define levels of quality in program features.

(2) *There are many ways in which a teacher preparation program can be excellent.* Different programs are planned and implemented differently and are acceptable if they are planned and implemented well. The Commission's standards are intended to differentiate between good and poor programs. The standards do not require all programs to be alike, except in their quality, which assumes different forms in different environments.

(3) *The curriculum of teacher education plays a central role in a program's quality.* The Commission adopts curriculum standards that attend to the most significant aspects of knowledge and competence. The standards do not prescribe particular configurations of courses, or particular ways of organizing content in courses, unless professionals on an advisory panel have determined that such configurations are essential for a good curriculum. Similarly, curriculum standards do not assign unit values to particular domains of study unless there is a professional consensus that it is essential for the Commission's standards to do so. Curriculum standards for agriculture teacher preparation are listed as Standards 1 through 16 in this handbook.

(4) *Teacher education programs should prepare candidates to teach the public school curriculum effectively.* The Commission asked the Agriculture Advisory Panel to examine and discuss the *Agriculture Education Implementation Guide,* as well as other state curriculum policies in agriculture education. The major themes and emphases of subject matter programs for teachers must be congruent with the major strands and goals of the school curriculum. It is also important for future teachers to be in a position to *improve* the school curriculum on the basis of new developments in the scholarly disciplines and in response to changes in student populations and community needs. However, it is indispensable that the Commission's standards give emphasis to the subjects and topics that are most commonly taught in public schools.

(5) *In California's public schools, the student population is so diverse that the preparation of educators to teach culturally diverse students cannot be the exclusive responsibility of professional preparation programs in schools of education.* This preparation must begin early in the collegiate experience of prospective teachers. The Commission expects subject matter preparation programs to contribute to this preparation, and asked the Agriculture Advisory Panel to recommend an appropriate program standard. The panel concurred with this request and recommended Standard 14 in Part 2 of this handbook.

(6) *The curriculum of a teacher education program should be based on an explicit statement of purpose and philosophy. An excellent program also includes student services and policies such as advisement services and admission policies.* These components of teacher preparation contribute significantly to the quality of the program; they make the program more than a collection of courses. The Commission asked the Agriculture Advisory Panel to develop standards related to (a) the philosophy and purpose of agriculture teacher preparation and (b) significant, noncurricular components of teacher preparation, to complement the curriculum standards. Again the panel concurred, and Standards 1 and 17 through 20 are the result.

(7) *The assessment of each student's attainments in a teacher education program is a significant responsibility of the institution that offers the program.* This assessment should go beyond a review of transcripts to verify that acceptable grades have been earned in required and elective courses. The specific form, content and methodology of the assessment should be determined by the institution. In each credential category, the Commission's standards attend to the overall quality of institutional assessments of students in programs. Standard 19 in this document is consistent with this policy of the Commission.

(8) *The Commission's standards of program quality allow quality to assume different forms in different environments.* The Commission did not ask the advisory panel to define all of the acceptable ways in which programs could satisfy a quality standard. The standards should define *how well* programs must be designed and implemented; they must not define specifically and precisely *how* programs should be designed or implemented.

(9) *The Commission's standards of program quality are roughly equivalent in breadth and importance.* Each standard is accompanied by a rationale that states briefly why the standard is important to the quality of teacher education. The standards should be written in clear, plain terms that are widely understood.

(10) *The Commission assists in the interpretation of the standards by identifying the important factors that should be considered when a program's quality is judged.* The Commission's adopted standards of program quality are mandatory; each program must satisfy each standard. "Factors to Consider" are not mandatory in the same sense, however. These factors suggest the types of questions that program reviewers ask and the types of evidence they will assemble and consider when they judge whether a standard is met. Factors to consider are not "mini-standards" that programs must meet. The Commission expects reviewers to weigh the strengths and weaknesses of a program as they determine whether a program meets a standard. The Commission does not expect every program to be excellent in relation to every factor that could be considered.

(11) *Whether a particular program fulfills the Commission's standards is a judgment that is made by professionals who have been trained in interpreting the standards.* Neither the Commission nor its professional staff make these judgments without relying on subject matter experts who are trained in program review and evaluation. The review process is designed to ensure that subject matter programs fulfill the Commission's standards initially and over the course of time.

The Commission fulfills one of its responsibilities to the public and the profession by adopting and implementing standards of program quality and effectiveness. While assuring the public that educator preparation is excellent, the Commission respects the considered judgments of educational institutions and professional educators, and holds educators accountable for excellence. The premises and principles outlined above reflect the Commission's approach to fulfilling its responsibilities under the law.

Analysis and Adoption of the Agriculture Program Standards

The Agriculture Teacher Preparation and Assessment Advisory Panel drafted the program quality standards and a set of preconditions for program approval during three two-day meetings in 1995. Meeting in public, the Commission then reviewed and discussed the draft standards and preconditions, as well as a draft plan for implementing the standards. The Commission distributed the draft standards, preconditions, and implementation plan to agriculture educators throughout California, with a request for comments and suggestions. The draft standards and other policy proposals were forwarded to:

- Academic administrators of California colleges and universities;
- Chairpersons of Agriculture Departments in colleges and universities;
- Deans of Education in California colleges and universities;
- Presidents of professional associations of agriculture teachers; and
- Agriculture professors, teachers and specialists.

The Commission asked 140 middle and high school principals to forward the draft policies to agriculture teachers and curriculum specialists for their analysis and comments.

After allowing a period for public comments, the Commission's professional staff compiled the responses to each standard and precondition, as well as comments about the implementation plan, which were reviewed thoroughly by the Advisory Panel. The panel exercised its discretion in responding to the suggestions, and made minor changes in the draft standards and preconditions. On February 1, 1996, the Advisory Panel presented the completed standards, preconditions, and implementation plan to the Commission, which adopted them on February 2, 1996.

Alignment of Program Standards and Subject Matter Assessments

Since 1970, many applicants have qualified for the Single Subject Credential in Agriculture by passing a standardized exam that was adopted by the Commission: the National Teachers Examination (NTE) in Agriculture. These prospective teachers of agriculture qualified for credentials without completing programs of subject matter study that were approved by the Commission. Following an exhaustive study of the validity of the NTE examinations in 1987, the Commission determined the need for new examinations that more accurately reflect (1) the subject matter programs that prepare teachers in California and (2) the curriculum in California's public schools.

The Commission awarded a contract to National Evaluations Systems, Inc. (NES) in January 1995, to develop new single subject examinations that align with the subject matter program standards. The Commission and NES asked the Agriculture Advisory Panel to develop subject matter assessment specifications that would be as parallel and equivalent as possible with the new subject matter program standards in this handbook. These assessment specifications will guide the scope and content of test items in the development of the new agriculture examination. The advisory panel's draft specifications were disseminated to 175 agriculture teachers, professors, and curriculum specialists throughout California to determine their relatedness to the job of an agriculture teacher. Following an extensive review of the draft specifications, the panel made minor revisions and the completed specifications were adopted by the Commission on February 2, 1996.

These specifications are now the basis for the new agriculture examination being developed by NES, which will include both a multiple-choice and a constructed-response component. This examination will be designed to assess a candidate's agricultural knowledge and skills, and the ability to respond critically to complex problems and situations encountered in the field of agriculture. Candidates who seek to qualify for the Single Subject Credential in Agriculture by examination will be required to pass the Single Subject Assessment for Teachers (SSAT) in Agriculture beginning with the first test administration in October 1996.

The Commission's new *Specifications for the Assessment of Subject Matter Knowledge and Competence in Agriculture* are included in this handbook (pages 34 through 40) to serve as a resource in the design and evaluation of subject matter programs for future teachers of agriculture.

Standards for Professional Teacher Preparation Programs

The effectiveness of agriculture education in California schools does not depend entirely on the subject matter preparation of agriculture teachers. Another critical factor is the teacher's ability to *teach* agriculture. To address the *pedagogical* knowledge and effectiveness of agriculture teachers, the Commission adopted and implemented *Standards of Program Quality and Effectiveness for Professional Teacher Preparation Programs*. These thirty-two standards define levels of quality and effectiveness that the Commission expects of teacher education programs that are offered by schools of education. These standards originated in Commission-sponsored research as well as the published literature on teacher education and teacher effectiveness. Approximately 1,500 educators from all levels of public and private education participated in developing the standards during a two-year period of dialogue and advice. The standards are now the basis for determining the status of professional preparation programs for Single Subject Teaching Credentials in California colleges and universities. The Commission also adopted special standards for future teachers who intend to teach students with limited English skills in the schools. The standards in this handbook have been prepared for subject matter programs, and are designed to complement the Commission's existing standards for programs of pedagogical preparation.

Subject Matter Standards for Prospective Elementary School Teachers

Elementary school teachers are expected to establish foundations of knowledge, skills, and attitudes that young students need in order to succeed in more advanced classes in secondary schools. To address the preparation of future classroom teachers in elementary schools, the Commission appointed an advisory panel to develop new *Standards of Program Quality for the Subject Matter Preparation of Elementary Teachers*. Following a thorough process of research, development and consultation, the Commission adopted these standards, which relate to (1) the broad range of subjects that elementary teachers must learn, and (2) the essential features and qualities of programs offered in liberal arts departments. The Commission appointed and trained two professional review panels, which have examined 72 subject matter programs for prospective elementary teachers, and have recommended 62 of these programs for approval by the Commission. As a result of this reform initiative, approximately 25,000 prospective elementary teachers are now enrolled in undergraduate programs that meet high standards of quality for subject matter preparation across a broad range of disciplines.

Overview of the Agriculture Standards Handbook

Part 2 of the handbook includes the twenty basic standards for agriculture, and the Advisory Panel's *Specifications for the Subject Matter Knowledge and Competence of Prospective Teachers of Agriculture*. Part 3 of the handbook provides information about implementation of the new standards in California colleges and universities.

Contributions of the Agriculture Advisory Panel

The California Commission on Teacher Credentialing is indebted to the Agriculture Teacher Preparation and Assessment Advisory Panel for the successful creation of *Standards of Program Quality and Effectiveness for the Subject Matter Preparation of Agriculture Teachers*. The Commission believes strongly that the panel's standards will improve the teaching and learning of agriculture in public schools.

Request for Assistance from Handbook Users

The Commission periodically reviews its policies, in part on the basis of responses from colleges, universities, school districts, county offices, professional organizations and individual professionals. The Commission welcomes all comments about the standards and information in this handbook, which should be addressed to:

California Commission on Teacher Credentialing
Professional Services Division
1900 Capitol Ave
Sacramento, California 95814-4213

Part 2

Standards of Program Quality and Effectiveness in Agriculture

Definitions of Key Terms

Standard

A "standard" is a statement of program quality that must be fulfilled for initial or continued approval of a subject matter program by the Commission. In each standard, the Commission has described an acceptable level of quality in a significant aspect of agriculture teacher preparation. The Commission determines whether a program satisfies a standard on the basis of an intensive review of all available information related to the standard by a review panel whose members (1) have expertise in agriculture teacher preparation, (2) have been trained in the consistent application of the standards, and (3) submit a recommendation to the Commission regarding program approval.

The Commission's adopted Standards of Program Quality and Effectiveness for Subject Matter Programs in Agriculture begin on page 14 of this handbook. The Commission's authority to establish and implement the standards derives from Section 44259 (b) (5) of the California Education Code.

Factors to Consider

"Factors to Consider" serve to guide program review panels in judging the quality of a program in relation to a standard. Within the scope of a standard, each factor defines a dimension along which programs vary in quality. The factors identify the dimensions of program quality that the Commission considers to be important. To enable a program review panel to understand a program fully, a college or university may identify additional quality factors and may show how the program fulfills these added indicators of quality. In determining whether a program fulfills a given standard, the Commission expects the review panel to consider all of the related quality factors in conjunction with each other. In considering the several quality factors for a standard, excellence in one factor compensates for less attention to another indicator by the institution. For subject matter programs in agriculture, the adopted Factors to Consider begin on page 14.

Precondition

A "precondition" is a requirement for initial and continued program approval that is based on California state laws or administrative regulations. Unlike standards, preconditions specify requirements for program compliance, not program quality. The Commission determines whether a program complies with the adopted preconditions on the basis of a program document provided by the college or university. In the program review sequence, a program that meets all preconditions is eligible for a more intensive review to determine if the program's quality satisfies the Commission's standards. Preconditions for the approval of subject matter programs in agriculture are on page 13. Details regarding the program review sequence are on pages 50 through 55.

Preconditions for the Approval of Subject Matter Preparation Programs in Agriculture

(1) Programs of academic preparation in agriculture must comprise **at least** 45 semester hours or the quarter unit equivalent.

(2) Programs of academic preparation must include a basic set of courses which develop a foundation across the domains of agriculture (animal science, plant science/soil science, ornamental horticulture, agriculture business management, natural resources and forestry, and agricultural mechanics) and which will fulfill Standards 2 through 7. These courses should comprise 70 to 80 percent of the program.

Each program submission shall include a listing and description of the courses that constitute this set of courses. Institutions shall have flexibility to determine whether their programs offer a specific course or courses for each subject commonly taught or courses offering multiple coverage of these subjects (California Administrative Code Section 80085.1).

(3) Programs of academic preparation must include courses that provide specialization to supplement the basic set. These courses will comprise 20 to 30 percent of the program. Institutions shall have flexibility to define their program in terms of specifically required coursework or in terms of electives within each area (California Administrative Code Section 80085.1). See Standard 8.

Standards of Program Quality and Effectiveness

Category I: Curriculum and Content of the Program

Standard 1

Program Philosophy and Purpose

The subject matter preparation program in agriculture is based on an explicit statement of program philosophy that expresses its purpose, design, and desired outcomes, and defines the institution's concept of a well-prepared teacher of agriculture. The program philosophy, design, and desired outcomes are appropriate for preparing students to teach agriculture in California schools.

Rationale for Standard 1

To ensure that a subject matter program is appropriate for prospective teachers, it must have an explicit statement of philosophy that expresses the institution's concept of a well-prepared teacher of the subject. This statement provides direction for program design and it assists the faculty in identifying program needs and emphases, developing course sequences, and conducting program reviews. The philosophy statement also informs students of the basis for program design, and communicates the institution's aims to school districts, prospective faculty members, and the public. The responsiveness of a program's philosophy, design and desired outcomes to the contemporary conditions of California schools are critical aspects of its quality.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- The program philosophy, design, and desired outcomes are collectively developed by participating faculty and advisory bodies; reflect an awareness of recent paradigms and research in the discipline of agriculture; and are consistent with each other.
- The program philosophy is consistent with the major themes and emphases of the *California State Agriculture Education Implementation Guide,* other state curriculum documents, and nationally adopted guidelines for teaching agriculture.
- The statement of program philosophy shows a clear awareness of the preparation that candidates need in order to teach agriculture effectively among diverse students in California schools.
- Expected program outcomes for students are defined clearly so that student assessments and program reviews can be aligned appropriately with the program's goals.
- The institution periodically reviews and reconsiders the program philosophy, design, and intended outcomes in light of recent developments in the discipline, nationally accepted standards and recommendations, and the needs of public schools.
- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 2

Animal Science

The program requires basic preparation in animal science that develops knowledge, skill, and the ability to integrate and apply practical applications in the areas of animal science and production.

Rationale for Standard 2

Knowledge of the scientific basics of animal science is of fundamental importance to agriculture educators. Understanding the anatomy and physiology of domestic animals is necessary to understand how body systems function and their interrelationships in homeostasis. In order to teach animal management and care, educators must have a basic knowledge of animal nutrition, reproduction, and health. Basic knowledge of animal genetics and heritability traits is necessary for selection and production of quality domestic animals.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- Study of the different breeds of domestic animals and their uses.
- Study of the anatomy of major body systems and their interrelationships.
- Study of the basic theory of inheritance.
- Study of the basic physiology of digestive and reproductive systems in domestic animals.
- Study of the factors that influence nutrition and feeding.
- Study of the symptoms of unhealthy animals.
- Study of the basic causes of common infectious and noninfectious diseases in domestic animals.
- Study of the issues related to the ethical treatment of animals.
- Study of the environmental requirements, facilities, tools, and equipment appropriate for domestic animals.
- Study of the careers in animal science.
- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 3

Plant Science and Soil Science

The program requires basic preparation that develops knowledge, skill, and the ability to integrate and apply applications in the areas of plant science and soil science.

Rationale for Standard 3

Knowledge of the scientific basics of plant and soil science is of fundamental importance to agriculture educators. Understanding plant genetics, reproduction, and growth requirements, including soil/water relationships, is essential for educators to teach proper production and management techniques.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- Study of the role of soil and land classification in plant production.
- Study of the requirements for plant growth, reproduction, and development.
- Study of the genetics and heritability traits of plants.
- Study of the role and safe use of fertilizers in plant production.
- Study of the role of water in plant production and the various methods of irrigation.
- Study of the major principles and safe methods of crop protection.
- Study of cultural practices and equipment required in crop production and processing (planting through post-harvest activities).
- Study of food safety and related issues.
- Study of environmental and conservation factors related to plant and soil science.
- Study of the careers in plant and soil science.
- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 4

Ornamental Horticulture

The program requires basic preparation that develops knowledge, skill, and the ability to integrate and apply applications in the area of ornamental horticulture.

Rationale for Standard 4

Knowledge and skills in ornamental horticulture have become increasingly important to students enrolled in agricultural education. Career opportunities in this area are growing rapidly and promise to offer tremendous opportunities well into the next century.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- Study of landscape design principles.
- Study of greenhouse management practices, including marketing of ornamentals.
- Study of turf management practices.
- Study of plants and products as they relate to ornamental horticulture.
- Study of floristry and floriculture principles and practices.
- Study of equipment and tools commonly used in the ornamental horticulture industry.
- Study of the careers in the ornamental horticulture industry.
- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 5

Agricultural Business Management

The program requires preparation that develops knowledge, skill, and the ability to integrate and apply basic economics principles, record keeping practices, planning systems, management concepts, and marketing tools as they relate to the agriculture industry.

Rationale for Standard 5

Knowledge of record keeping, computer literacy, and purchasing/marketing functions is fundamental for the understanding of management concepts in the field of agriculture. These functions are applied consistently across wide areas of agricultural activity and production, and provide a basic means to evaluate and analyze agricultural business decisions.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- Study of record keeping, financial management, and decision making as it applies to agricultural business.
- Study of computer applications as they apply to agricultural business.
- Study of purchasing, marketing, and merchandising functions as they apply to agricultural business.
- Study of basic economic principles and agricultural business management practices.
- Study of California's agricultural business industry and its role in our global economy.
- Study of the careers in the agricultural business industry.
- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 6

Natural Resources and Forestry

The program provides a broad range of experiences designed to enhance each candidate's awareness of the environment, recognizing the renewable and non-renewable resources, energy and mineral resources and the responsibilities that agriculture has in managing these resources.

Rationale for Standard 6

The successful development of our state has been possible in large part due to our natural environment. It is essential that students are educated in how society and the environment must coexist, what is renewable and what is nonrenewable and what they can do to contribute to a sustainable high quality of our environment.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- Study of the importance of soil, water, weather, forestry, and wildlife as natural resources.
- Study of the interdependence of plant and animal communities in the ecosystem.
- Study of the advantages and disadvantages of various methods of producing energy.
- Study of the problems confronting human, plant, and animal life as natural resources are depleted and production of nonrenewable resources becomes limited.
- Study of the importance of energy and mineral resources, including sources, conservation, and future needs.
- Study of how the forests, range lands, wetlands, and coastlands can support multiple uses, including timber, mining, grazing, and recreational use.
- Study of careers related to natural resources and forestry.
- Study of other subjects related to this standard that are brought to the reviewers' attention by the institution.

Standard 7

Agricultural Mechanics

The program requires basic preparation that develops knowledge, skill, and the ability to integrate and apply practical applications in the area of agricultural construction, equipment maintenance, and safe operations of agricultural equipment.

Rationale for Standard 7

Knowledge and skills in agricultural mechanics are fundamental to most areas of agriculture. Additionally, it is essential that students are prepared to safely operate agricultural tools and equipment.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- Study and practice in the safe use, care, and maintenance of hand/power tools and equipment common to the agricultural/horticultural industry.
- Study and practice in the agricultural applications of electric welding procedures.
- Study and practice in the agricultural applications of oxy-fuel cutting procedures.
- Study and practice in the agricultural applications of plumbing and electrical skills.
- Study and practice in the agricultural applications of construction/fabrication procedures.
- Study and practice in the agricultural applications of measurement and surveying principles.
- Study and practice in the agricultural applications in mixing, pouring, and finishing concrete.
- Study and practice in the agricultural applications of drafting and creating and interpreting drawings.
- Study and practice in power units common to the agricultural industry.
- Study of careers related to agricultural mechanics.
- Study of other subjects related to this standard that are brought to the reviewers' attention by the institution.

Standard 8

Specialization in Agriculture

The program in agriculture includes specialized study in either animal science, plant science/soil science, ornamental horticulture, agricultural business management, natural resources and forestry, or agricultural mechanics.

Rationale for Standard 8

Individual teachers should have sufficient knowledge and experience to convey the applications in agriculture. Teachers should also develop an understanding of the techniques and technologies used in their area of specialization.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program:

- Requires the student to demonstrate the depth of study significantly beyond that which is required in the core.
- Includes demonstration of skills usually required of a new employee in the discipline.
- Encourages students to apply scientific, mathematical, business, communications, and interpersonal knowledge and skills appropriate to the discipline.
- Has other quality factors that are related to this standard and are brought to the team's attention by the institution.

Standard 9

Agriculture Education as a Profession

The program includes instruction in the philosophy and history of agriculture education, the status of agriculture in contemporary society, and the role of the educator in the school, community, and industry.

Rationale for Standard 9

Knowledge of the most current educational and industry issues and initiatives is critical for preparing students in secondary agricultural education programs for a smooth transition from the classroom to the worksite, or for further advanced training and education. State and federal educational initiatives often profoundly impact the direction of these educational programs, while agricultural industry issues can deeply affect the basic agricultural literacy needed to effectively function within the industry.

Understanding the role of agriculture education in contemporary society requires knowledge of its philosophical and historical development and enables students to begin to formulate a personal philosophy. Students need to understand that active involvement in local school settings, professional organizations, and in the legislative process is vital to continual professional growth and to the promotion of agriculture education.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- The application of current philosophies to the agriculture curriculum.
- Study of current programs and practices within a historical perspective.
- Examination of ethics, values, and scope of responsibilities of the professional agriculture educator.
- Study of current issues affecting agriculture such as legislation, regulations, policies, and practices.
- Emphasis on the benefits and responsibilities of being an active member in professional activities and organizations.
- Emphasis on the importance of staying abreast of the current knowledge base of the discipline.
- Study of relationships between the commodities and major industry organizations of agriculture.
- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 10

Integration of Concepts

The program provides opportunities for integrative study of the major themes and concepts of the program areas within agriculture, and the interrelationships that exist between agriculture areas and with other subject areas.

Rationale for Standard 10

The California Agriculture Curriculum is designed to enable students to explore and prepare for careers in agriculture while reinforcing core academic skills in the areas of English-language arts, history and social science, mathematics, visual arts, and science. The successful agriculture teacher must understand the interrelationships and interconnectedness between agriculture and other disciplines.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- Study of relationships between agriculture and other disciplines commonly taught in the public schools.
- Integrative study of the major themes and concepts of the program areas within agriculture as specified in Standards 2 through 7.
- Examinations of methodologies to achieve the integration of concepts between and among agriculture and other subjects commonly taught in the public schools.
- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 11

Field Experiences

Each program involves students in field experiences in school agriculture classes.

Rationale for Standard 11

Field experiences facilitate making collegiate instruction more meaningful. Student discussions during and following the field experiences promote a better understanding of the discipline of agriculture. Early field experiences help students to determine whether teaching careers in agriculture are suitable for them.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- A variety of observations and experiences in agriculture classes that occurs relatively early in the preparation program and includes opportunities to observe culturally diverse, at risk, and special-need students.
- Guided observations and experiences at high school agriculture classes that relate to coursework in the program.
- Student participation in analytical discussions that compare their field experiences with those of other students in the program.
- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 12

Occupational Experience

The program requires a minimum of 1500 hours of occupational experiences (with at least 500 of those hours post high school) in the technical agricultural career cluster areas, which develop the ability to integrate and apply attitudes, skills, and practical knowledge associated with an agricultural entrepreneurial or workplace setting to the high school agricultural education program.

Rationale for Standard 12

Experiential learning complements and extends the more formal technical coursework and laboratories generally considered as the "university experience." More importantly, actual experience in one or more agricultural occupations provides the candidates with life experience credibility in both the classroom and the agricultural industry in the community, each a critical factor for success in teaching agriculture.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- An early assessment of the candidates' occupational experience made cooperatively between CDE state agriculture education staff and program staff.
- Information, advisement, and support provided by qualified individuals who work with candidates to meet occupational experience requirements.
- Study of other subjects related to this standard that are brought to the reviewers' attention by the institution.

Standard 13

Agriculture Technology

The program provides opportunities for the student to examine and use all forms of technology that are appropriate in agriculture.

Rationale for Standard 13

New uses of technology are leading to significant changes in agriculture. For California's schools to serve contemporary students effectively, teachers must be prepared in the discipline-based uses of technology. Prospective teachers of agriculture should therefore consider and use new technologies while they learn the discipline they will teach.

Special Note

This standard does not require that students examine or practice the pedagogical uses of technology.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- Students in the program use appropriate technological tools as they study about agriculture. Examples might include: soil and moisture testing, controlled atmospheric testing devices, and electronic controls or equipment.
- Students analyze, compare, and evaluate the value of relevant technologies in agriculture.
- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 14

Diversity and Equity in the Program

Each student in the agriculture preparation program acquires knowledge, understanding and appreciation of the perspectives and contributions of both men and women and diverse cultural and ethnic groups to agriculture. The program promotes educational equity by utilizing instructional, advisement, and curricular practices that offer equal access to program content and career options for all students.

Rationale for Standard 14

Students who attend California schools are increasingly diverse. They live in a society that has benefited from the perspectives and contributions of men and women from many cultural and ethnic groups. Prospective teachers must understand and appreciate the cultural perspectives and academic contributions of these groups. They must also be aware of barriers to academic participation and success and must experience equitable practices of education during their preparation.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- The program provides knowledge and enhances understanding and appreciation of the cultural dimensions and context of agriculture and the study of agriculture.
- Each student learns about the contributions of diverse cultural, ethnic ,and gender groups to agriculture within the United States and in other regions/nations.
- Students examine ways in which the historic development of agriculture and agriculture education have affected different cultural, ethnic, gender and handicapped groups.
- Course work in the program fosters understanding, respect and appreciation of human differences, including cultural, ethnic, gender, and language variations.
- Students experience classroom practices and use instructional materials that promote educational equity among learners from diverse backgrounds.
- The program includes faculty role models from diverse cultural and ethnic groups, men and women, and individuals with exceptional needs.
- The program includes faculty who are concerned about and sensitive to diverse cultural and ethnic groups, men, women, and individuals with exceptional needs.
- The institution encourages men and women of diverse backgrounds to enter and complete the subject matter program and to pursue careers in agriculture education.
- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 15

Agriculture Teaching and Assessment

The program employs multiple strategies, activities, and materials that are appropriate for effective teaching and assessing development and learning in agriculture; and provides a foundation for subsequent studies of teaching and assessment methods.

Rationale for Standard 15

An institution's use of varied teaching and assessment strategies accommodates alternative learning styles and enhances the accomplishments of students in a subject matter program. Prospective teachers of agriculture are most likely to use a variety of pedagogical methods if they have encountered these alternatives while learning agriculture. First-hand acquaintance with a variety of instructional and assessment strategies, activities, and materials creates many possibilities for a prospective teacher's own pedagogical style, and establishes an essential foundation for the subsequent study and use of effective teaching methods in agriculture.

Special Note

Agriculture departments are expected to use their discretion in fulfilling this standard, which does not require the use of particular teaching or assessment methods in any given course.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- Students in the program encounter a variety of appropriate strategies for teaching agriculture effectively, such as collaborative learning groups, peer instruction, demonstrations, technology-based instruction, participation in activities and events, lectures, and discussions facilitated by students as well as instructors.

- Students in the program experience a variety of appropriate strategies for assessing student progress and accomplishments in agriculture, research exercises, technological record keeping, and oral interviews as well as written essays.

- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 16

Safety Procedures

The program instructs students in proper safety procedures prior to laboratory and field experiences and includes instruction in emergency procedures and the proper use, storage, handling, and disposal of hazardous materials and equipment.

Rationale for Standard 16

Recent legislation concerning safety and the handling of chemicals has significantly changed laboratory and field practices. In order for agriculture instruction to be conducted in a safe and legally compliant manner, students must be properly instructed in matters of safety and emergency procedures.

Factors to Consider

When an evaluation team judges whether a program meets this standard, the Commission expects the team to consider the extent to which the program:

- Orients the student in safety procedures which are needed before and during laboratory and field experiences.
- Has facilities that are properly equipped with and students are instructed in the proper use of agriculture equipment, tools, and facilities.
- Includes instruction in emergency procedures and the proper use, storage, handling, and disposal of hazardous materials and equipment.
- Includes instruction on the current understanding of toxic, mutagenic, carcinogenic, and allergenic nature of certain chemicals.
- Includes information about ways to obtain current information about emergency procedures and the proper use, storage, handling, and disposal of hazardous materials and equipment.
- Exhibits other quality factors that are related to this standard and are brought to the team's attention by the institution.

Category II: Essential Features of Program Quality

Standard 17

Coordination of the Program

Each agriculture subject matter preparation program is coordinated effectively by one or more persons who are responsible for program planning, implementation, and review.

Rationale for Standard 17

The accomplishments of students in a subject matter preparation program depend in part on the effective coordination of the program by responsible members of the institution's administrative staff and/or academic faculty. For students to become competent in the subjects they will teach, all aspects of their subject matter preparation must be planned thoughtfully, implemented conscientiously, and reviewed periodically by designated individuals.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- There is effective communication and coordination among the academic program faculty, and between the faculty and local school personnel, local community colleges, and the professional education faculty.

- One or more persons are responsible for overseeing and assuring the effectiveness of student advisement and assessment in the program (refer to Standards 18 and 19), and of program review and development by the institution (refer to Standard 20).

- The institution ensures that faculty who teach courses in the agriculture program have backgrounds of advanced study or professional experience and currency in the areas they teach.

- Sufficient time and resources are allocated for responsible faculty and/or staff members to coordinate all aspects of the program.

- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 18

Student Advisement and Support

A comprehensive and effective system of student advisement and support provides appropriate and timely program information and academic assistance to students and potential students, and gives attention to transfer students and members of groups that traditionally have been underrepresented among teachers of agriculture.

Rationale for Standard 18

To become competent in a discipline of study, students must be informed of the institution's expectations, options, and requirements; must be advised of their own progress toward academic competence; and must receive information about sources of academic and personal assistance and counseling. Advisement and support of prospective teachers are critical to the effectiveness of subject matter preparation programs, particularly for transfer students and members of groups that traditionally have been underrepresented in the discipline. In an academic environment that encourages learning and personal development, prospective teachers acquire a student-centered outlook toward education that is essential for their subsequent success in public schools.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- Advisement and support in the program are provided by qualified individuals who are assigned those responsibilities and who are available and attentive when the services are needed.

- Advisement services include information about course equivalencies, financial aid options, admission requirements in professional preparation programs, state certification requirements, field-experience placements, and career opportunities.

- Information about subject matter program purposes, options, and requirements is available to prospective students and distributed to enrolled students.

- The institution encourages students to consider careers in teaching, and attempts to identify and advise interested individuals in appropriate ways.

- The institution actively seeks to recruit and retain students who are members of groups that traditionally have been underrepresented in agriculture.

- The institution collaborates with community colleges to articulate academic coursework and to facilitate the transfer of students into the subject matter program.

- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 19

Assessment of Subject Matter Competence

The program uses multiple measures to assess the subject matter competence of each student formatively and summatively in relation to Standards 1 through 10. The scope and content of each student's assessment is congruent with the studies the student has completed in the program.

Rationale for Standard 19

An institution that offers content preparation for prospective teachers has a responsibility to verify their competence in the subject(s) to be taught. It is essential that the assessment in agriculture use multiple measures, have formative and summative components, and be as comprehensive as Standards 1 through 10. Its content must be congruent with each student's core, breadth, and perspective studies in the program (see Preconditions 2 and 3 on page 13). Course grades and other course evaluations may be part of the summative assessment, but may not comprise it entirely.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- The assessment process examines each student's performance in agriculture, and includes student performances, projects, and demonstrations in addition to written examinations based on criteria established by the institution.
- The assessment encompasses the content of standards and is congruent with each student's core, breadth, and perspective studies in the program (as defined by the institution in response to Preconditions 2 and 3).
- The assessment process is valid, reliable, equitable, and fair, and includes provisions for student appeals.
- The assessment scope, process, and criteria are clearly delineated and made available to students.
- The institution makes and retains thorough records regarding each student's performance in the assessment.
- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 20

Program Review and Development

Each subject matter program has a comprehensive, ongoing system of review and development that involves faculty, students, and appropriate public school personnel, including agriculture teachers and agriculture industry representatives, which leads to continuing improvements in the program.

Rationale for Standard 20

The continued quality and effectiveness of subject matter preparation depends on periodic reviews of and improvements to the programs. Program development and improvement should be based in part on the results of systematic, ongoing reviews that are designed for this purpose. Reviews should be thorough and should include multiple kinds of information from diverse sources.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- Systematic and periodic reviews of the subject matter program reexamine its philosophy, purpose, design, curriculum, and intended outcomes for students (consistent with Standard 1).

- Information is collected about the program's strengths, weaknesses, and needed improvements from participants in the program, including faculty, students, recent graduates, and employers of recent graduates, and from other appropriate public school personnel, including teachers of agriculture.

- Program development and review involves consultation among departments that participate in the program (including the Education and Agriculture Departments) and includes a review of recommendations by elementary, secondary, and community college educators.

- Program improvements are based on the results of periodic reviews, the implications of new developments in agriculture, the identified needs of program students and school districts in the region, and recent agriculture curriculum policies of the state.

- Assessments of students in the program (pursuant to Standard 19) are also reviewed and used for improving the philosophy, design, curriculum, and/or outcome expectations of the program.

- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Specifications for the Assessment of Subject Matter Knowledge and Competence for Prospective Teachers of Agriculture

Agriculture Teacher Preparation and Assessment Advisory Panel
California Commission on Teacher Credentialing
1996

A student who seeks to earn the Single Subject Teaching Credential in Agriculture should have a basic knowledge of animal science; plant and soil science; ornamental horticulture; agricultural business management and global society; natural resources and forestry; and agricultural mechanics. The student should also be skillful at higher-order thinking skills such as analyzing and interpreting information; comparing, contrasting and synthesizing ideas; thinking critically; and drawing sound inferences and conclusions from information that is provided or widely known.

To verify that these expectations have been attained, the Commission's standardized assessment of agriculture competence consists of two components: (1) a multiple-choice knowledge assessment and (2) a constructed-response performance assessment. For the two sections of the assessment, the Agriculture Teacher Preparation and Assessment Advisory Panel drafted the following specifications of knowledge, skills, and abilities needed by teachers of agriculture. Adopted by the Commission, these specifications illustrate the knowledge, skills, and abilities that students should acquire and develop in a subject matter program for future teachers of agriculture.

Both the multiple-choice and constructed-response components of the assessment are based on the same content categories (see Section 1 below). Examinees are expected to have a command of the subject matter content that is typically studied in a discipline-based setting. In addition, they are expected to demonstrate an understanding of that content from an integrated and inter-disciplinary perspective.

Section 1: Knowledge of Agriculture

Prospective teachers of agriculture should have a command of knowledge in six areas, as follows, in order to pass the assessment of knowledge of agriculture:

I. Animal Science (20%)
II. Plant and Soil Science (20%)
III. Ornamental Horticulture (17%)
IV. Agricultural Business Management and Global Society (17%)
V. Natural Resources and Forestry (13%)
VI. Agricultural Mechanics (13%)

I. Animal Science (20%)

- **Understand domestic animals and their uses in society.**

  Includes breeds of beef and dairy cattle, swine, sheep, horses, and poultry; products derived from domestic animals; principles and procedures for evaluating livestock, poultry, and carcasses; ethical management and treatment of domestic animals (e.g., handling, medication, marketing); and the uses of domestic animals in society.

- **Understand environmental and facilities management.**

  Includes the concept of a sustainable environment; environmental needs (e.g., range requirements, temperature control, appropriate housing) of beef and dairy cattle, swine, sheep, horses, and poultry; facilities, tools, and equipment used to provide or maintain appropriate environments; and the effects of domestic animals on the environment (e.g., effects of grazing, use of water resources).

- **Understand the anatomy and physiology of animals.**

  Includes major organs and systems, their functions, and their interrelationships in beef and dairy cattle, swine, sheep, horses, and poultry; the physiology of these organs and systems; and the application of animal anatomy and physiology to the care of domestic animals (e.g., the relationship of the digestive system to nutrition and feeding practices, the relationship of the reproductive system to practices during parturition).

- **Apply knowledge of animal reproduction and genetics in domestic animals.**

  Includes breeding methods and procedures; factors that influence breeding decisions (e.g., phenotype); basic principles of inheritance and genetics (e.g., Mendelian genetics; the genetic basis of animal selection; function of genes, chromosomes, and DNA); processes of meiosis and fertilization; and procedures for the care of animals during pregnancy and parturition.

- **Analyze nutritional requirements of domestic animals.**

  Includes factors influencing nutritional requirements and feeding options; sources and functions of animal nutrients; symptoms of nutrient deficiencies; the composition, classification, and nutritional value of various types of feed; uses of various feeds for specific species; and types, functions, and effects of feed additives.

- **Understand practices for handling domestic animals and maintaining their health**.

  Includes principles and procedures for the safe and humane handling of livestock and poultry; purposes and methods of castrating, dehorning, branding, marking, ear notching, tagging, tattooing, docking, and medicating livestock; characteristics of healthy and unhealthy animals; types and causes of common infectious and noninfectious diseases in domestic animals; types, symptoms, effects, and life cycles of internal and external parasites; and methods for preventing and treating diseases and parasites.

II. Plant and Soil Science (20%)

- **Understand characteristics, components, and properties of soil.**

  Includes types of soil and their characteristics, the composition and components of soil, soil testing methods, the interpretation and use of soil tests, the role of soil in plant production, factors affecting the ability of soil to support plant growth, and methods and procedures for improving the ability of soil to support plant growth.

- **Understand plant anatomy and physiology.**

  Includes plant structures, organs, and systems; their functions and processes; processes and products of photosynthesis, respiration, and transpiration; processes of sexual and asexual reproduction; principles of plant breeding, hybridization, and genetics; principles of grafting; and requirements for plant growth and development.

- **Understand soil treatments and growing media.**

  Includes the role of fertilizers in plant production; differences between organic and inorganic fertilizers; the importance of nitrogen, phosphorus, and potassium to plant growth and development; symptoms of and remedies for soil deficiencies; procedures for the safe handling, application, and disposal of fertilizers; procedures for adjusting soil pH; soil pasteurization procedures; types, components, characteristics, and uses of growing media; and mixtures of soil, mineral matter, and organic matter.

- **Apply methods and procedures for protecting and caring for plants.**

  Includes types and characteristics of plants, crops, and seed varieties; soil, water, light, and nutrient requirements for plant growth; the effects of environmental factors (e.g., temperature, humidity, hardiness zones) on plant growth; procedures for propagating, transplanting, and hardening plants; appropriate planting and rotation schedules; types, characteristics, and symptoms of plant pests, pathologies, and weeds; methods of controlling plant diseases, pests, insects, and weeds (including integrated pest management); procedures for the safe handling, application, and disposal of pesticides and herbicides; and pollutants that are harmful to plants and their symptoms and effects.

- **Apply principles of land classification, management, and irrigation.**

  Includes factors that influence land classification; factors and procedures for land management planning; procedures for selecting and using tillage equipment; methods of irrigation; factors affecting decisions about irrigation, drainage, tillage, and crop rotation practices; causes and characteristics of various kinds of erosion; procedures for controlling soil erosion; and government agencies and public services involved in land management.

- **Understand environmental and food safety issues related to plant and soil science.**

  Includes land use and water use issues, procedures for soil and water conservation, control of runoff, and safety issues and societal concerns related to food products (e.g., genetically manipulated crops, irradiated food, pesticide residues).

III. Ornamental Horticulture (17%)

- **Apply landscape design principles.**

  Includes basic elements and principles of landscape planning, design, construction, and maintenance; factors affecting design choices and decisions; and landscape design tools and equipment, their uses, and principles of operation.

- **Understand greenhouse and nursery management.**

  Includes features of greenhouse and nursery facilities; techniques for regulating climate and other physical factors; pest management procedures (including integrated pest management); procedures for the safe handling and application of fertilizers and pesticides; and greenhouse and nursery tools and equipment, their uses, and principles of operation.

- **Apply turf management principles.**

  Includes types and characteristics of grasses; factors affecting the selection of turf (e.g., environmental conditions, projected uses); the preparation of seedbeds; procedures involved in the installation of turf; maintenance practices; signs and symptoms of common pests and diseases; procedures for the safe handling, application, and disposal of fertilizers and pesticides; and turf management tools and equipment, their uses, and principles of operation.

- **Apply principles of floriculture and floristry.**

  Includes practices related to the production of cut flowers and flowering plants (e.g., forcing); the preparation, care, and handling of flowers; signs and symptoms of common pests and diseases; procedures for the safe handling, application, and disposal of fertilizers and pesticides; elements and principles of floral design; the selection of appropriate floral designs for given purposes (e.g., corsages, centerpieces); materials used in the construction of floral arrangements; floriculture and floristry tools and equipment, their uses, and principles of operation; and safety practices related to floriculture.

- **Understand ornamental plants and related products.**

  Includes types and characteristics of ornamental plants; procedures related to their propagation and care; factors to consider in selecting and marketing ornamental plants for given purposes; principles and methods of pruning; signs and symptoms of common pests and diseases; procedures for the safe handling and application of fertilizers and pesticides; products developed using ornamental plants (e.g., terrariums, dried plant materials); and tools and equipment, their uses, and principles of operation.

IV. Agricultural Business Management and Global Society (17%)

- **Understand financial management and decision making in agricultural business.**

  Includes basic accounting procedures; recordkeeping procedures related to taxes; standard banking procedures as they relate to agricultural business; types, sources, and costs of credit; types of life, health, and accident insurance and their benefits; functions of business and employment insurance; and factors affecting decisions about financial planning and management in agricultural business settings.

- **Understand agricultural business management practices.**

  Includes factors and procedures for budgeting, scheduling, market forecasting, and calculating production costs; principles and procedures related to keeping accurate business records; factors and skills involved in personnel supervision; scheduling needs and procedures; and state and federal regulations governing agricultural business practices (e.g., regulations relating to safety, animal welfare, environmental protection).

- **Understand principles and procedures related to purchasing, marketing, and merchandising in agricultural business.**

  Includes factors involved in making purchasing decisions; characteristics of various types of market outlets; marketing strategies for agricultural products; methods and requirements for labeling products; procedures for setting prices; principles of design and merchandising in the display of products; and government agencies, programs, and regulations related to agricultural marketing.

- **Understand the role of computers and technology in agricultural business.**

  Includes the importance of technology to the production, processing, and marketing of agricultural products; types and characteristics of computer hardware and software used in various aspects of agricultural businesses; capabilities and limitations of technology in solving problems in agriculture; common applications of computer technology in agriculture; and the use of on-line services and telecommunication in agricultural business.

- **Understand agricultural business in California and the world.**

  Includes principles of supply and demand, diminishing returns, comparative advantage, and resource substitution; the economic impact of leading commodities; the unique diversity of California agriculture; the importance of foreign trade to agricultural business; agricultural products that are commonly imported and exported; the role of government in international agribusiness; the effects of international trade agreements on agricultural businesses in California; and the role of federal and state agencies (e.g., USDA, EPA) in regulating agricultural business practices.

- **Understand agriculture education as a profession.**

  Includes the philosophy and history of agriculture education; the role of the agriculture teacher in the school, community, and industry; the ethics, values, and responsibilities of the agriculture educator; the influence of agriculture industry issues and initiatives on agriculture education; legislation, regulations, and policies that affect agriculture education; and the importance and methods of staying abreast of the current knowledge base of the discipline.

V. Natural Resources and Forestry (13%)

- **Understand the relationships among agriculture, the environment, and society.**

  Includes the importance of soil, water, forests, and wildlife as natural resources; the relationship between agriculture (including forestry) and the environment; the effects of various agricultural practices on the environment; economic factors related to environmental practices in agriculture; and the role of government and society in regulating and monitoring agriculture and agricultural practices.

- **Understand renewable and nonrenewable resources.**

  Includes types of natural resources and their characteristics, the importance of energy and mineral resources, the importance and uses of forestry products, uses of natural resources in agriculture, problems associated with the depletion of natural resources, the effects of agricultural practices and procedures on water and other natural resources, the effects of the availability of natural resources on agriculture, and issues related to available reserves and usage patterns related to natural resources (e.g., diversion of water for agricultural purposes).

- **Understand the role of forest management in protecting habitats and species.**

  Includes the ecological concepts of niche, community, and ecosystem; the dependence of species on specific habitats; the role of forestry in preserving habitats and protecting the environment; the effects of forestry practices on the environment; the interrelationships among climate, weather, habitats, and species; and current issues in forestry related to habitat protection.

- **Understand the concept of multiple-use management.**

  Includes the importance of multiple-use management and procedures for facilitating multiple use (e.g., timber, mining, grazing, recreation) in forest, rangeland, wetlands, and coastlands.

VI. Agricultural Mechanics (13%)

- **Apply procedures related to measurement and drafting.**

  Includes the reading and use of measuring instruments, notations and symbols commonly used in drafting, mathematical calculations related to measurement and drafting, basic principles of surveying, and procedures for creating and interpreting working drawings.

- **Understand small engines and power equipment.**

  Includes types and characteristics of small engines and power equipment and their uses, components, principles of operation, and maintenance procedures.

- **Apply construction principles and techniques.**

  Includes basic principles of woodworking and carpentry, masonry, plumbing, electrical work, and metalworking and welding; operating principles related to power tools and machinery used in agricultural construction; and techniques used to construct, repair, and maintain physical structures in agriculture.

- **Understand safety principles and practices in agriculture.**

  Includes safety procedures related to the care and use of equipment and machinery in agriculture and the importance of proper maintenance schedules and procedures in ensuring safety.

Section 2: Constructed-Response Assessment in Agriculture

The second section of the standardized assessment of prospective teachers of agriculture consists of constructed-response assessments. Each assessment requires demonstration of one or more of the following abilities.

- The ability to evaluate and/or interpret a given situation or case study related to agriculture. Information will be provided in printed form (e.g., written descriptions, tables, graphs, maps, diagrams).

- The ability to select and/or design appropriate methods and materials to meet specified goals in agriculture-related contexts.

- The ability to explain and justify evaluations, interpretations, selections, and designs using appropriate information from the field of agriculture and related fields (e.g., biological and social sciences).

The constructed-response assessments will pose problems based on the topics presented in the test specifications for Agriculture. Examples of the types of problems that might be included on the test are as follows:

- Interpreting multiple sources of information about an animal with a health-related problem and proposing appropriate steps to be taken in an attempt to ameliorate the problem.

- Applying the principles and techniques of plant protection to a given agricultural situation (e.g., remedying an existing pest problem, preventing a pest problem).

Part 3

Implementation of Agriculture Teaching Standards

Implementation of Program Quality Standards for Subject Matter Preparation in Agriculture

The Program Quality Standards for Subject Matter Preparation in Agriculture are part of a broad shift in the policies of the California Commission on Teacher Credentialing related to the preparation of professional teachers and other educators in California colleges and universities. The Commission initiated this broad policy change to foster greater excellence in educator preparation and to combine flexibility with accountability for institutions that educate prospective teachers. The success of this reform depends on the effective *implementation* of program quality standards for each credential.

Pages 43 through 46 of the handbook provide general information about the transition to program quality standards for all teaching credentials. Then the handbook offers detailed information about implementing the agriculture standards (pages 47 through 55).

Transition to Quality Standards for All Teaching Credentials

The Commission is gradually developing and implementing Standards of Program Quality and Effectiveness for all teaching credentials. The overall purpose of the standards is to provide the strongest possible assurance that future teachers will have the expertise and abilities they will need for their critically important roles and responsibilities. Among the most significant areas of knowledge and abilities for teaching are those associated with the subjects of the school curriculum.

The Commission began to develop new standards for the subject matter preparation of teachers in 1986. In that year, the Commission appointed an expert advisory panel in elementary education, which developed *Standards of Program Quality for the Subject Matter Preparation of Elementary Teachers*. Following an extensive process of consultation with elementary educators, the Commission adopted the subject matter program standards for the Multiple Subject Teaching Credential. The standards have now been implemented in 58 colleges and universities, which offer a total of 66 programs.

In 1989, the Commission established expert subject matter advisory panels to develop standards for the subject matter preparation of prospective secondary teachers in English, mathematics, science, and social science. The panels consisted of K-12 teachers of the subjects, public school curriculum specialists, university professors of the subjects, and other subject matter experts in California. Following extensive consultation with colleges, universities, professional organizations, and local and state education agencies, the Commission adopted the standards in 1992. In a similar manner, in 1991 the Commission established expert panels to develop subject matter standards in art, music, physical education, and languages other than English. These standards were adopted by the Commission in 1994.

In January of 1995, the Commission appointed advisory panels to develop program standards in agriculture, business education, health education, home economics, and industrial and technology education. Initial drafts of standards in these subjects were distributed widely for discussion and comment before they were completed by the panels and adopted by the Commission on February 2, 1996.

Improvements in the Review of Subject Matter Programs

The last occasion on which the Commission reviewed subject matter programs in agriculture was 1983. There are relatively few similarities between (a) the program guidelines and review procedures that were used in 1983 and (b) the Commission's plan for implementing the new standards in this handbook. In reviewing programs according to the new standards, several major improvements are anticipated.

(1) The standards are *much broader* than the prior guidelines for subject matter programs. The standards provide considerably *more flexibility to institutions.*

(2) As a set, the standards are *more comprehensive* in addressing the *quality* of subject matter preparation. They provide a stronger assurance of excellent preparation.

(3) The new Program Review Panels will conduct *more intensive reviews* that will focus on *program quality issues* rather than course titles and unit counts.

(4) The new panels will have *more extensive training* because the standards require that they exercise more professional discretion about the *quality* of programs.

(5) Institutional representatives will have opportunities to meet with the Review Panels to discuss questions about programs and standards. Improved communications should lead to better decisions about program quality.

Alignment of Program Standards and Performance Assessments

The Teacher Preparation and Licensing Act of 1970 established the requirement that candidates for teaching credentials verify their competence in the subjects they intend to teach. Candidates for teaching credentials may satisfy the subject matter requirement by completing approved subject matter programs or by passing subject matter assessments that have been adopted by the Commission. The Commission is concerned that the scope and content of the subject matter assessments be aligned and congruent with the program quality standards in each subject.

To achieve this alignment and congruence in agriculture, the Commission asked the Agriculture Advisory Panel to develop subject matter assessment specifications that would be consistent in scope and content with the program quality standards in this handbook. Following extensive discussion and review by subject matter experts throughout the state, the Commission adopted a detailed set of *Specifications for the Assessment of Subject Matter Knowledge and Competence of Prospective Teachers of Agriculture*. These specifications, which are included in this handbook (pages 34 through 40), are the basis for the new subject matter assessment in agriculture being developed by National Evaluation Systems, Inc.

The Commission is pleased that the *Specifications* for subject matter assessments are as parallel as possible with the scope, content and rigor of the standards for subject matter programs. To strengthen the alignment between subject matter assessments and programs, college and university faculty and administrators are urged to examine the *Specifications* as a source of information about knowledge, abilities and perspectives that are important to include in subject matter programs for teachers of agriculture.

Validity and Authenticity of Subject Matter Assessments

The Commission is also concerned that the subject matter assessments of prospective teachers address the full range of knowledge, skills, and abilities needed by teachers of each subject. For fifteen years the Commission relied on subject matter examinations that consisted entirely of multiple-choice questions. In 1987-88, the Commission evaluated fifteen of these subject matter exams comprehensively. More than 400 teachers, curriculum specialists, and university faculty examined the specifications of these tests, as well as the actual test questions. An analysis of the reviewers' aggregated judgments showed that (1) particular changes were needed in each multiple-choice test and (2) each multiple-choice test should be supplemented by a *performance assessment* in the subject.

Since 1988, the Commission's subject matter advisory panels have created performance assessments for each of ten Single Subject Credentials. In most cases, these performance assessments consist of constructed-response problems or tasks, to which examinees construct complex responses instead of selecting an answer among four given choices. Examinees' responses are scored on the basis of specific criteria that were created by the advisory panels and are administered by subject specialists who are trained in the scoring process. Candidates for the ten Single Subject Credentials must pass the performance assessment as well as a multiple-choice test of their subject matter knowledge, unless they complete an approved subject matter program. Meanwhile, for the Multiple Subject Credential, the Commission developed and adopted the *Multiple Subjects Assessment for Teachers (MSAT)* that consists of a multiple-choice (*Content Knowledge*) section, and a constructed-response *(Content Area Exercises)* section. By developing and adopting these assessments, the Commission has committed itself to assessing the subject matter knowledge and competence of prospective teachers as validly and comprehensively as possible. Likewise, the new examinations in agriculture, business, health science, home economics, and industrial and technology education developed by National Evaluation Systems, Inc. (NES) will include constructed-response components.

New Terminology for "Waiver Programs"

In 1970, the legislature clearly regarded the successful passage of an adopted examination as the principal way to meet the subject matter requirement. However, the 1970 law also allowed candidates to complete Commission-approved subject matter programs to "waive" the examinations. Because of this terminology in the 1970 statute, subject matter programs have commonly been called *waiver programs* throughout the state.

In reality, the law established two alternative ways for prospective teachers to meet the subject matter requirement. An individual who completes an approved subject matter program is not required to pass the subject matter examination, and an individual who achieves a passing score on an adopted exam is not required to complete a subject matter program. Overall, the two options are used by approximately equal numbers of candidates for initial teaching credentials. Subject matter programs are completed by more than half of the candidates for Single Subject Credentials, but the adopted examination is the preferred route for more than half of all Multiple Subject Credential candidates.

Because of the significant efforts of the Commission and its expert advisory panels, subject matter programs and examinations are being made as parallel and equivalent to each other as possible. The term *waiver programs* does not accurately describe a group of programs that are alternatives to subject matter examinations. For this reason, the Commission uses the term *subject matter programs* instead of *waiver programs*, which is now out of date.

Ongoing Review and Approval of Subject Matter Programs

After the Commission approves subject matter programs on the basis of quality standards, the programs will be reviewed at six-year intervals, in approximately the same way as the Commission reviews professional preparation programs in California colleges and universities. Periodic reviews will be based on the Standards of Program Quality and Effectiveness. Like professional preparation programs, subject matter programs will be reviewed on-site by small teams of trained reviewers. Reviewers will obtain information about program quality from institutional documents and interviews with program faculty, administrators, students, and recent graduates. Prior to a review, the Commission will provide detailed information about the scope, methodology and potential benefits of the review, as well as other implications for the institution.

Review and Improvement of Subject Matter Standards

Beginning in 2002-2003, the Commission will begin a cycle of review and reconsideration of the *Standards of Quality and Effectiveness for Subject Matter Programs in Agriculture* and other subjects. The standards will be reviewed and reconsidered in relation to changes in academic disciplines, school curricula, and the backgrounds and needs of California students (K-12). Reviews of program standards will be based on the advice of subject matter teachers, professors and curriculum specialists. Prior to each review, the Commission will invite interested individuals and organizations to participate in it. If the Commission modifies the agriculture standards, an amended handbook will be forwarded to each institution with an approved program.

Agriculture Teacher Preparation: Commission Timeline for Implementation of Standards

Dates	Steps in the Implementation of Standards
1996	The Commission adopts the Standards of Program Quality and Effectiveness that are on pages 14 through 33 of this handbook. The Preconditions on page 13 are also adopted.
July-October 1999	The Executive Director disseminates the handbook. The Commission's staff conducts regional workshops to answer questions, provide information, and assist colleges and universities.
November 1999 - February 2000	The Commission selects, orients and trains a Program Review Panel in Agriculture. After March 1, 2000, these qualified content experts begin to review programs in relation to the standards.
March 1, 2000	Review and approval of programs under the new standards begins. No new subject matter programs in agriculture will be reviewed in relation to the Commission's "old" guidelines of 1982.
2000-2001	Institutions may submit programs for preliminary or formal review on or after March 1, 2000. Once a "new" program is approved, all students who were not previously enrolled in the "old" program (i.e., all new students) should enroll in the new program. Students may complete an old program if they enrolled in it either (1) prior to the commencement of the new program at their campus, or (2) prior to September 1, 2001, whichever occurs first.
September 1, 2001	"Old" programs that are based on the 1983 guidelines must be superseded by new approved programs. After September 1, 2001, no new students should enroll in an old program, even if a new program in agriculture is not yet available at the institution.
2001-2002 2002-2003	The Commission continues to review program proposals based on the standards and preconditions in this handbook.
September 1, 2004	The final date for candidates to complete subject matter preparation programs that were approved under the 1983 guidelines. To qualify for credentials based on an "old" program, students must (1) have entered that program prior to either (a) the implementation of a new program at their institution, or (b) September 1, 2001, whichever occurred first, and they must (2) complete the old program by September 1, 2002. Students who do not do so may qualify for credentials by passing the Commission's adopted examinations.

Implementation Timeline: Implications for Prospective Teachers

Based on the implementation plan that has been adopted by the Commission (prior page), candidates for Single Subject Credentials in Agriculture who do not plan to pass the Commission-adopted subject matter examinations should enroll as early as feasible in subject matter programs that fulfill the standards in this handbook. After a "new" program begins at an institution, no students should enroll for the first time in an "old" program (i.e. one approved under the Commission's "old" guidelines of 1983).

Candidates who enrolled in programs that were approved on the basis of the "old" guidelines ("old" programs) may complete those programs provided that (1) they entered the old programs either before new programs were available at their institutions, or before September 1, 2001, whichever comes first, *and* (2) they complete the old programs before September 1, 2004.

Regardless of the date when new programs are implemented at an institution, no new students should enroll in an old program after September 1, 2001, even if a new program is not yet available at the institution. These students may meet the subject matter requirement for the Single Subject Teaching Credential by passing the subject matter examinations that have been adopted for that purpose by the Commission.

Ordinarily, students are not formally "admitted" to a subject matter program on a specified date. Rather, students begin a subject matter program when they initially enroll in courses that are part of the program. The Commission offers the following clarification of the timeline on the prior page.

(1) Students who have completed one or more courses in an old subject matter program by September 1, 2001, may complete that program and be recommended for a credential provided that these students also complete all requirements for the subject matter program (not necessarily the credential) by September 1, 2004.

(2) Students who have not completed any courses in an old program by September 1, 2001, should be advised that after that date they should not take courses that are part of the old program (unless those courses are also a part of a new program). Instead, they should enroll in courses that are part of the new program. In many cases, the two programs will have some courses in common.

(3) It may be necessary for some students to enroll in "new program courses" prior to the approval of the new program. Institutions may recommend these students for Single Subject Teaching Credentials even if the students have completed part of a new program prior to Commission approval of that program.

Once the Commission approves a new subject matter program, students who have already taken courses that are part of that program may continue to take courses in the program and complete the program even though they started taking courses before the program was approved by the Commission. Because of the flexibility of this policy, institutions should not expect to see any change in the September 1, 2001 date for the implementation of subject matter programs under the standards in this handbook.

Implementation Timeline Diagram

March 2000

Colleges and universities may begin to present program proposals for review by the Commission's Subject Matter Program Review Panel.

2000-2001

Once a program is approved under the standards, students who were not previously enrolled in the old program should enroll in the new program.

September 1, 2001

After this date, no new students should enroll in an old program, even if a new program in agriculture is not yet available at the institution.

2001-2002 and 2002-2003

The Commission will continue to review program proposals. Prior to the approval of new programs, students may enroll in "new program courses" that meet the standards.

September 1, 2004

Final date for candidates to complete subject matter programs that were approved under the Commission's old guidelines (adopted in 1983).

Implementation Handbook: Review and Approval of Subject Matter Programs in Agriculture

A regionally accredited institution of postsecondary education that would like to offer (or continue to offer) a Program of Subject Matter Preparation for the Single Subject Credential in Agriculture may present a program proposal that responds to the standards and preconditions in this handbook. The submission of programs for review and approval is voluntary for colleges and universities; candidates can qualify for the Single Subject Credential by passing a standardized assessment of their agriculture knowledge and competence.

For a subject matter program in agriculture to be approved by the Commission, it must satisfy the preconditions and standards in this handbook. If an institution would like to offer two or more distinct programs of subject matter preparation in agriculture, a separate proposal should be forwarded to the Commission for each program. For example, one program in agriculture might have a concentration in agricultural mechanics, while a second program at the same institution could be a more general program without a particular concentration.

The Commission is prepared to review subject matter program proposals beginning on March 1, 2000. Prior to that date, the Commission's professional staff is available to consult with institutional representatives, and to do preliminary reviews of draft proposals (see page 51 for details).

Initial Statement of Institutional Intent

To assist the Commission in planning and scheduling reviews of program proposals, each institution is asked to file a Statement of Intent at least four months prior to submitting a proposal. Having received a timely Statement of Intent, the Commission will make every effort to review a proposal expeditiously. In the absence of a timely statement, the review process will take longer.

The Statement of Intent should be signed by the individual with chief responsibility for academic programs at the institution. It should provide the following information:

- The subject for which approval is being requested (agriculture).
- The contact person responsible for each program (include phone number).
- The expected date when students would initially “enroll” in each program.
- An indication as to whether or not the institution expects to submit a program for "informal" review (defined below).
- The date when each program will be submitted for formal review and approval.

If an institution plans to submit proposals for two or more programs in agriculture, the Statement of Intent should include this essential information for each program, and should indicate whether or not the programs will have distinct emphases.

The Program Proposal Document

For each program, the institution should prepare a program proposal that includes a narrative response to each precondition and standard on pages 13 through 33. Please provide six (6) copies of each program document.

Preconditions. A narrative section of the proposal should explain how the program will meet each precondition on page 13. In responding to the preconditions, the document must show the title and unit value of each required and elective course in the basic core component of the program (Precondition 2) and the same information about each course in the breadth and perspective component (Precondition 3). The proposal must also include brief course (catalog) descriptions of all required and elective courses.

Standards. In the major part of the program document, the institution should respond to each Standard of Program Quality and Effectiveness on pages 14 through 33. It is important to respond to each element of a standard, but a lengthy, detailed description is not necessary. Examples of how particular elements of the standard are accomplished are particularly useful. An institution's program proposal should include syllabi of required and selected elective courses, along with other supporting documentation to serve as "back-up" information to substantiate the responses to particular standards.

Factors to Consider. A program proposal must show how the program will meet each standard. The purpose of factors to consider is to amplify specific aspects of standards, and to assist institutions in responding to all elements of a standard. The Commission considers the factors to be important aspects of program quality, but it is not essential that the document respond to every factor. The factors are *not "mini-standards,"* and there is *no expectation* that a program must meet all the factors in order to fulfill a standard. (For added information about factors to consider, please see pages 6 and 12.)

Institutions are urged to *reflect on* the factors to consider, which may or may not be used as the "organizers" or "headings" for responding to a standard. Institutions are also encouraged to describe all aspects of the program's quality, and not limit their responses to the adopted factors in this handbook. The quality of a proposal may be enhanced by information about "additional factors" that are related to the standards but do not coincide with any of the adopted factors.

Steps in the Review of Programs

The Commission is committed to conducting a program review process that is objective, authoritative and comprehensive. The agency also seeks to be as helpful as possible to colleges and universities throughout the review process.

Preliminary Staff Review. Before submitting program proposals for formal review and approval, institutions are encouraged to request preliminary reviews of *draft* documents by the Commission's professional staff. The purpose of these reviews is to assist institutions in developing programs that are consistent with the intent and scope of the standards, and that will be clear and meaningful to the external reviewers. Program documents may be submitted for preliminary staff review at any time; the optimum time is at least one month after submitting the Statement of Intent and at least two months prior to the expected date for submitting a completed proposal. Preliminary review is voluntary; its purpose is to assist institutions in preparing program documents that can be reviewed most expeditiously in the formal review process.

Review of Preconditions. An institution's response to the preconditions is reviewed by the Commission's professional staff because the preconditions are based on state laws and regulations, and do not involve issues of program quality. If the staff determines that the program complies with the requirements of state laws and administrative regulations, the program is eligible for a quality review (based on the standards) by a panel of subject matter experts. If the program does not comply with the preconditions, the staff returns the proposal to the institution with specific information about the lack of compliance. Such a proposal may be resubmitted once the compliance issues have been resolved. In a few circumstances, the staff may seek the advice of the Subject Matter Program Review Panel concerning the appropriateness of proposed coursework to meet a particular precondition.

Review of Program Quality Standards. Unlike the preconditions, the standards address issues of program quality and effectiveness, so each institution's response to the standards is reviewed by a small Program Review Panel of subject matter experts. During the review process, there is an opportunity for institutional representatives to meet with the panel to answer questions or clarify issues that may arise. Prior to such a discussion, the panel will be asked to provide a preliminary written statement of the questions, issues or concerns to be discussed with the institutional representative(s).

If the Program Review Panel determines that a proposed program fulfills the standards, the Commission's staff recommends the program for approval by the Commission during a public meeting no more than eight weeks after the panel's decision.

If the Program Review Panel determines that the program does not meet the standards, the document is returned to the institution with an explanation of the panel's findings. Specific reasons for the panel's decision are communicated to the institution. If the panel has substantive concerns about one or more aspects of program quality, representatives of the institution can obtain information and assistance from the Commission staff. With the staff's prior authorization, the college or university may also obtain information and assistance from one or more designated members of the panel. After changes have been made in the program, the proposal may be resubmitted to the Commission's staff for reconsideration by the panel.

If the Program Review Panel determines that minor or technical changes should be made in a program, the responsibility for reviewing the resubmitted proposal rests with the Commission's professional staff, which presents the *revised* program to the Commission for approval without further review by the panel.

Appeal of an Adverse Decision. An institution that would like to appeal a decision of the staff (regarding preconditions) or the Program Review Panel (regarding standards) may do so by submitting the appeal to the Executive Director of the Commission. The institution should include the following information in the appeal:

- The original program proposal, and the stated reasons of the Commission's staff or the review panel for not recommending approval of the program.
- A specific response by the institution to the initial denial, including a copy of the resubmitted document (if it has been resubmitted).
- A rationale for the appeal by the institution.

The Executive Director may deny the appeal, or appoint an independent review panel, or present the appeal directly to the Commission for consideration.

Responses to Six Common Standards

The Commission adopted six standards for programs in *all* single subject disciplines.

Standard 1 - Program Philosophy and Purpose
Standard 14 - Diversity and Equity in the Program
Standard 17 - Coordination of the Program
Standard 18 - Student Advisement and Support
Standard 19 - Assessment of Subject Matter Competence
Standard 20 - Program Review and Development

These six standards are referred to as common standards because they are essentially the same in all subject areas.

An institution's program proposal in agriculture should include subject-specific responses to Standards 1 and 14, along with subject-specific responses to the other curriculum standards in Category I (see pages 15 through 29). An institution's program proposal in agriculture *may* also include a unique response to Standards 17, 18, 19 and 20. Alternatively, the institution *may* submit a "generic response" to these four common standards. In a generic response, the institution should describe how subject matter programs in all subjects will meet the four standards. A generic response should include sufficient information to enable an interdisciplinary panel of reviewers to determine that the four common standards are met in each subject area. Once the institution's generic response is approved, it would not be necessary to respond to the four standards in the institution's program proposal in agriculture, or in any other subject.

Selection, Composition and Training of Program Review Panels

Review panel members are selected because of their expertise in agriculture, and their knowledge of agriculture curriculum and instruction in the public schools of California. Reviewers are selected from institutions of higher education, school districts, county offices of education, organizations of agriculture education experts, and other professional organizations. Members are selected according to the Commission's adopted policies that govern the selection of panels. Members of the Commission's Teacher Preparation and Assessment Advisory Panels may be selected to serve on Program Review Panels.

In agriculture, each program proposal is reviewed by at least one professor of agriculture, at least one secondary school teacher of agriculture, and a third Review Panel member who is either another professor, or another teacher, or a curriculum specialist in agriculture.

The Program Review Panel is trained by the Commission's staff. Training includes:

- The purpose and function of subject matter preparation programs.
- The Commission's legal responsibilities in program review and approval.
- The role of the review panel in making program determinations.
- The role of the Commission's professional staff in assisting the panel.
- A thorough analysis and discussion of each standard and rationale.
- Alternative ways in which the standard could be met.
- An overview of review panel procedures.
- Simulated practice in reviewing programs.
- How to write program review panel reports.

The training also includes analysis of the Common Standards. The reviewers of agriculture programs are trained specifically in the consistent application of the subject-specific standards in agriculture.

Subject Matter Program Review Panel Procedures

The Subject Matter Program Review Panel meets periodically to review programs that have been submitted to the Commission during a given time period. Whenever possible, Review Panels in more than one subject meet at the same time and location. This enables institutional representatives to meet with reviewers in more than one subject area, if necessary.

Review Panel meetings usually take place over three days. Meetings typically adhere to the following general schedule:

- First Day - Review institutional responses to common standards. Preliminary discussion of responses to curriculum standards.
- Second Day - Thorough analysis of responses to curriculum standards. Prepare preliminary written findings for each program, and FAX these to institutions.
- Third Day - Meet with representatives of institutions to clarify program information, discuss preliminary findings and identify possible changes in programs. Prepare written reports that reflect the discussions with institutions.

Subject Matter Program Review Panel Reports

Normally, the Review Panel's written report is mailed to the institution within two weeks after the panel meeting. If the report is affirmative, the Commission’s staff presents the report to the Commission during a public meeting no more than eight weeks after the panel’s decision.

If the Review Panel report indicates that the program does not meet the standards, specific reasons for the panel’s decision are included in the report. The institution should first discuss such a report with the Commission’s staff. One or more designated members of the panel may also be contacted, but only after such contacts are authorized by the staff.

If the report shows that minor or technical changes are needed in a program, the Review Panel gives responsibility for reviewing the resubmitted proposal to the staff.

Further Information and Communications Related to Standards, Programs, and Program Reviews

Regional Workshops for Colleges and Universities

Following publication of this handbook, the Commission will sponsor regional workshops to assist institutions in understanding and implementing the new standards. The agenda for each workshop will include:

- Explanation of the intended meaning of the standards, according to a member of the Teacher Preparation and Assessment Advisory Panel.
- Explanation of the Commission's implementation plan, and description of the program review process.
- Answers to questions about the standards, and examples presented by panel members and others who are experienced in implementing standards.
- Opportunities to discuss subject-specific questions in small groups.

All institutions that plan to submit program proposals (or are considering this option) are welcome to participate in the workshops. Specific information about the workshop dates and locations is provided separately from this handbook.

Communications with the Commission's Staff and Program Review Panel

The Commission would like the program review process to be as helpful as possible to colleges and universities. Because a large number of institutions prepare teachers in California, representatives of an institution should first consult with the Commission's professional staff regarding programs that are in preparation or under review. The staff responds to all inquiries expeditiously and knowledgeably. Representatives of colleges and universities should contact members of a Subject Matter Program Review Panel only when they are authorized to do so by the Commission's staff. This restriction must be observed to ensure that membership on a panel is manageable for the reviewers. If an institution finds that needed information is not sufficiently available, please inform the designated staff consultant. If the problem is not corrected in a timely way, the executive director of the California Commission on Teacher Credentialing should be contacted.

Request for Assistance from Handbook Users

The Commission welcomes comments about this handbook, which should be addressed to:

California Commission on Teacher Credentialing
Professional Services Division
1900 Capitol Ave
Sacramento, California 95814-4213